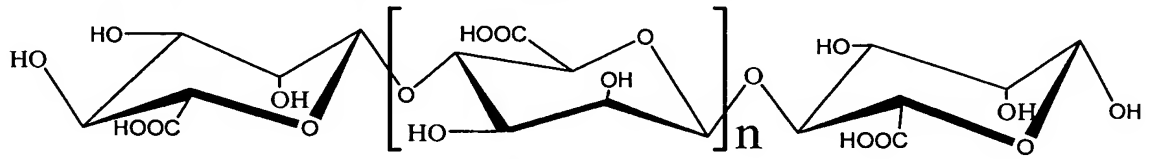
We claim:

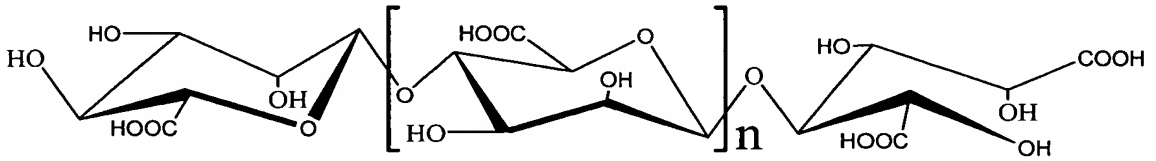
1. An alginate oligosaccharide represented by formula I or its derivatives or pharmaceutically-acceptable salts thereof, wherein the alginate oligosaccharide is composed of β-D-mannuronic acid linked by α-1,4 glycosidic bonds:



(I)

wherein, n represents 0 or an integer of 1 to 19.

2. The alginate oligosaccharide or its derivatives or pharmaceutically-acceptable salts thereof according to claim 1, characterized in that the reduced terminal in position 1 of the said alginate oligosaccharide derivative is carboxyl radical, as shown by the following formula II:



(II)

wherein, n represents 0 or an integer of 1 to 19.

3. The alginate oligosaccharide or its derivatives or pharmaceutically-acceptable salts thereof according to claim 1, characterized in that n is 2 to 12, preferably 4 to 8.

4. A process for preparing the alginate oligosaccharide or its derivatives or pharmaceutically-acceptable salts thereof according to claim 1, the process comprising the following steps:

an alginate aqueous solution is reacted for about 2 to 6 hrs in an autoclave at pH 2-6 and a temperature of about 100-120°C; and

pH is adjusted to about 7 after the reaction is stopped.

5. The process according to claim 4, characterized in that the said alginate is sodium alginate and reacted for 4 hrs under the condition of pH 4 and 110°C.

6. The process according to claim 4, characterized in that after adjusting pH to about 7, alcohol is added to give a precipitate; the precipitate is filtered off with suction, dehydrated, dried and desalted.

7. The process according to claim 4, characterized in that after the alginate solution reacting for about 2 to 6 hrs in an autoclave at pH 2-6 and a temperature of about 100-120°C, an oxidant is added and reacted for 15 min to 2 hrs at a temperature of 100-120°C.

8. The process according to claim 7, characterized in that the said oxidant is copper hydroxide and reacted for 30 min at a temperature of 100°C.

9. A pharmaceutical composition containing an effective amount of the alginate oligosaccharide or its derivatives according to any one of claim 1 to 3, and pharmaceutically-acceptable carriers.

10. The pharmaceutical composition according to claim 9, characterized in that the

composition is any one selected from the group consisting of a medicament for the prophylaxis and treatment of Alzheimer's disease, an amyloid-β protein fibrils forming inhibitor, a medicament for the prophylaxis and treatment of diabetes, an islet amyloid protein fibrils forming inhibitor and a fibrils disaggregating promoter.